CLAIMS

1.   An image interpolation system for interpolating the gaps between the lines forming an image, comprising:

a virtual interpolation data generating means for

5   generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data; and

an interpolating means for interpolating the pixels between input image lines, based on the generated virtual

10   interpolation data.

2.   An image interpolation system for interpolating the gaps between the lines forming an image, comprising:

a virtual interpolation data generating means for

15   generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data; and

an interpolating means which, based on the generated virtual interpolation data, generates pre-interpolation

20   pixels on the input image lines, and interpolates the pixels between input image lines above and below by performing mutual operations between pre-interpolation pixels generated on the input image lines above and below.

25   3.   An image interpolation system for interpolating the gaps

between the lines forming an image, comprising:

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a virtual interpolation data generating means for generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line

5 data;

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an interpolation segment determining means for determining segments to be interpolated between the input image lines and the direction of interpolation, based on the generated virtual interpolation data; and

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10 an interpolating means which generates pre-interpolation pixels on the input image lines, based on the generated virtual interpolation data and the determined data of the segments to be interpolated, determined by the interpolation segment determining means, and interpolates

15 the pixels between input image lines based on the generated pre-interpolation pixels.

4. The image interpolation system according to Claim 3, wherein the interpolation segment determining means

20 comprises: a search condition setup means for setting up a pattern search range; a matching pattern condition setup means for setting up matching pattern conditions; and a first matching pattern searching means for searching for matching patterns based on the conditions designated by the search

25 condition setup means and by the matching pattern condition

setup means.

5.   The image interpolation system according to Claim 3, wherein the interpolation segment determining means

5   comprises: a search condition setup means for setting up a pattern search range; a matching pattern condition setup means for setting up matching pattern conditions; a first matching pattern searching means for searching matching patterns based on the conditions designated by the search condition setup

10   means and by the matching pattern condition setup means; a directional vector extracting means for extracting the direction of the vector of the detected matching patterns; and a second matching pattern searching means for searching for matching patterns existing in the extracted direction

15   of the vector, based on the conditions designated by the search condition setup means and by the matching pattern condition setup means.

6.   The image interpolation system according to Claim 1,

20   wherein the virtual interpolation data generated by the virtual interpolation data generating means is constructed of units of pixel-rows of data.

7.   The image interpolation system according to Claim 2,

25   wherein the virtual interpolation data generated by the

virtual interpolation data generating means is constructed of units of pixel-rows of data.

8.   The image interpolation system according to Claim 3,
5 wherein the virtual interpolation data generated by the virtual interpolation data generating means is constructed of units of pixel-rows of data.

9.   The image interpolation system according to Claim 4,
10 wherein the virtual interpolation data generated by the virtual interpolation data generating means is constructed of units of pixel-rows of data.

10. The image interpolation system according to Claim 5,
15 wherein the virtual interpolation data generated by the virtual interpolation data generating means is constructed of units of pixel-rows of data.

11. The image interpolation system according to Claim 1,
20 wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to
25 the calculated value of the difference in pixel data; and

a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

12. The image interpolation system according to Claim 2, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

13. The image interpolation system according to Claim 3, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; and a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; and a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

14. The image interpolation system according to Claim 4, wherein the virtual interpolation data generating means

comprises: an inter-pixel operating means for calculating

the difference in pixel data between the pixels on the

neighboring input image lines; and a normalizing means for

classifying the pixels into multiple classes according to

5   the calculated value of the difference in pixel data; and

a pattern extracting means for extracting rows of pixels

normalized and classified in an identical class as patterns.

15.   The image interpolation system according to Claim 5,

10   wherein the virtual interpolation data generating means

comprises: an inter-pixel operating means for calculating

the difference in pixel data between the pixels on the

neighboring input image lines; and a normalizing means for

classifying the pixels into multiple classes according to

15   the calculated value of the difference in pixel data; and

a pattern extracting means for extracting rows of pixels

normalized and classified in an identical class as patterns.

16.   The image interpolation system according to Claims 6

20   through 10, wherein the virtual interpolation data generating

means comprises: an inter-pixel operating means for

calculating the difference in pixel data between the pixels

on the neighboring input image lines; and a normalizing means

for classifying the pixels into multiple classes according

25   to the calculated value of the difference in pixel data; and

a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns.

17.   The image interpolation system according to Claim 1, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

18.   The image interpolation system according to Claim 2, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring

means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

5   19.   The image interpolation system according to Claim 3, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for

10   classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line

15   to be interpolated based on the predetermined threshold and editing them.

20.   The image interpolation system according to Claim 4, wherein the virtual interpolation data generating means

20   comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern

25   extracting means for extracting rows of pixels normalized

and classified in an identical class as patterns; and a coring means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

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21. The image interpolation system according to Claim 5, wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the

10 neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to the calculated value of the difference in pixel data; a pattern extracting means for extracting rows of pixels normalized and classified in an identical class as patterns; and a coring

15 means for judging the patterns extracted on the same line to be interpolated based on the predetermined threshold and editing them.

22. The image interpolation system according to Claim 16,

20 wherein the virtual interpolation data generating means comprises: an inter-pixel operating means for calculating the difference in pixel data between the pixels on the neighboring input image lines; a normalizing means for classifying the pixels into multiple classes according to

25 the calculated value of the difference in pixel data; a pattern

extracting means for extracting rows of pixels normalized

and classified in an identical class as patterns; and a coring

means for judging the patterns extracted on the same line

to be interpolated based on the predetermined threshold and

5   editing them.

23.   The image interpolation system according to Claim 17,

wherein the coring means comprises: an intra-pattern pixel

operating means for calculating the average of the pixel

10   differential values of individual pixels in each pattern;

and a pattern editing means for judging the average value

based on the predetermined threshold and editing patterns.

24.   The image interpolation system according to Claim 18,

15   wherein the coring means comprises: an intra-pattern pixel

operating means for calculating the average of the pixel

differential values of individual pixels in each pattern;

and a pattern editing means for judging the average value

based on the predetermined threshold and editing patterns.

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25.   The image interpolation system according to Claim 19,

wherein the coring means comprises: an intra-pattern pixel

operating means for calculating the average of the pixel

differential values of individual pixels in each pattern;

25   and a pattern editing means for judging the average value

based on the predetermined threshold and editing patterns.

26. The image interpolation system according to Claim 20,
wherein the coring means comprises: an intra-pattern pixel
5   operating means for calculating the average of the pixel
differential values of individual pixels in each pattern;
and a pattern editing means for judging the average value
based on the predetermined threshold and editing patterns.

10   27. The image interpolation system according to Claim 21,
wherein the coring means comprises: an intra-pattern pixel
operating means for calculating the average of the pixel
differential values of individual pixels in each pattern;
and a pattern editing means for judging the average value
15   based on the predetermined threshold and editing patterns.

28. The image interpolation system according to Claim 22,
wherein the coring means comprises: an intra-pattern pixel
operating means for calculating the average of the pixel
20   differential values of individual pixels in each pattern;
and a pattern editing means for judging the average value
based on the predetermined threshold and editing patterns.

29. An image interpolation method for interpolating the gaps
25   between the lines forming an image, comprising:

a step of generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data; and

a step of interpolating the pixels between input image
5   lines, based on the generated virtual interpolation data.

30.   An image interpolation method for interpolating the gaps between the lines forming an image, comprising:

a step of generating virtual interpolation data of
10   inter-lines between the lines of the input image, based on the input image line data; and

a step of generating pre-interpolation pixels on the input image lines based on the generated virtual interpolation data and interpolating the pixels between input image lines
.15   above and below by performing mutual operations between pre-interpolation pixels generated on the input image lines above and below.

31.   An image interpolation method for interpolating the gaps
20   between the lines forming an image, comprising:

a step of generating virtual interpolation data of inter-lines between the lines of the input image, based on the input image line data;

a step of determining segments to be interpolated between
25   the input image lines and/or the direction of interpolation,

based on the generated virtual interpolation data; and

a step of generating pre-interpolation pixels on the
input image lines, based on the generated virtual
interpolation data and the determined data of the segments

5   to be interpolated, and interpolating the pixels between input
image lines based on the generated pre-interpolation pixels.